

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Unlicensed Operation in the TV Broadcast Bands)	ET Docket No. 04-186
)	
Additional Spectrum for Unlicensed Devices)	ET Docket No. 02-380
Below 900 MHz and in the 3 GHz Band)	
To: The Commission		

REPLY COMMENTS OF THE NATIONAL TRANSLATOR ASSOCIATION

The Reply Comments of the National Translator Association are hereby
incorporated in the attached Engineering Statement.

Respectfully submitted,

NATIONAL TRANSLATOR
ASSOCIATION

/s/ Byron St. Clair
Byron St.Clair, President

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January 31, 2005



NATIONAL TRANSLATOR ASSOCIATION

OUR AIM – TO PROVIDE FM and TV SIGNALS in EVERY HOME

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ENGINEERING STATEMENT

Introduction

The National Translator Association (NTA) continues to be concerned with the problem of determining where unlicensed devices can be used without interference to TV reception. Several commentators have suggested that some form of signal detection be employed as either the primary means of determining vacant channels or as a backup to determinations from database entries. In particular "The Comments of IEEE 801" discuss the need for the use of cognitive radio techniques¹ and in the Executive Summary states²

We would however, point out that our studies point to the conclusion that the use of cognitive radio techniques - radios that are "smart" enough to sense their spectral environment and, as a system, respond accordingly to make optimum use of unused spectrum while assuring non-interference - will be the key to successfully accomplishing the Commission's underlying goal of allowing unlicensed devices to use this spectrum while preventing harmful interference to the existing licensed uses.

The "Comments of the WI-FI Alliance" state³

"Having done so, [the FCC developed interference criteria] the WFA is certain its membership can take the Commission's criteria and develop and produce devices that do not exceed interference thresholds and avoid completely co-channel operation"

Dedicated to the improvement of over the air broadcast service to all United States residents through the maximum utilization of TV and FM Translators.

¹Comments of IEEE 802 in this proceeding, paragraphs 16 to 19.

²Ibid page 3, 4th paragraph

³Comments of the WI-FI Alliance in this proceeding page 4, lines 18 - 20

Discussion

We in the translator world have had long experience with determining whether or not a TV signal is present at a particular location. Translators since their inception in 1956 have been required to detect the presence of the primary station's signal and use this information to ensure that the translator is turned off if the primary signal is not present. It has proven difficult to have the sensing function reliably.

Originally the sensing was done by a control signal taken from the AGC voltage developed by the incoming signal. However, the voltage differential between no signal and a useable signal is small and it has proven difficult in practice to maintain a stable threshold decision point. Later a more sophisticated approach came into use - a narrow band detector tuned to the horizontal sync pulse rate. This was an improvement but is still considered by translator users to be less than completely reliable.

As pointed out in the comments by others dynamic sensing is going to be necessary for the successful widespread operation of unlicensed devices on TV channels. Proponents suggest that cognitive techniques or dynamic sensing are practical but do not offer any real evidence that this is the case.

For instance UHF signals at reception locations exhibit hot and cold spots only a few feet apart due to reflections that add at one point and cancel at another. The height of the sensing antenna and a nearby home receiving antenna will likely be different which can produce wide discrepancies.

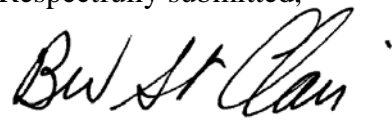
A portable unlicensed transmitter can have only an antenna that is comparable in size to the dimensions of the device. Further the sensing antenna must be approximately omnidirectional. This means its gain will of necessity be less than 0 dBi. A nearby fringe area home receiver would typically have an antenna with a gain of more than 10 dBi and be 15 to 30 feet higher. Thus the portable unlicensed device would not detect a signal that in fact was useable for home reception.

Conclusion

It is easy to suggest the use of dynamic receivers or cognitive devices but relying on such techniques to be accurate in thousands of diverse locations in all kinds of terrain in the absence of wide scale field tests is not prudent. It is also easy to claim, as the WI-FI alliance does, that unlicensed transmitters with the necessary protection can be developed but so far the claims are just claims..

Given that the claims of the proponents relating to interference protection are largely unsupported, the NTA urges the Commission to go no further with rules to permit unlicensed devices to operate on vacant TV channels until the proponents have demonstrated working systems that provide consistent and reliable protection to the reception of fringe area TV signals from primary stations and to the home reception of TV translator signals.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "B. W. St. Clair". The signature is written in a cursive, flowing style. To the right of the signature, there is a vertical red line.

B. W. St. Clair
President

January 31, 2005